

Station #2: Dissolved Oxygen
Work Sheet**Background**

All living things depend on oxygen to survive. In a water environment molecules of oxygen gas dissolve in the water. This is called dissolved oxygen (DO). In air, 20 out of every 100 molecules are oxygen. In water, only one to five molecules, out of every million molecules, are oxygen. This is why dissolved oxygen is measured in parts per million (ppm). Different species of aquatic organisms require different amounts of oxygen, but generally aquatic organisms require at least 6ppm for normal growth and development.

Water temperature and altitude influence how much oxygen water can hold; i.e., the *equilibrium value*. In general, warmer water cannot hold as much oxygen as colder water. Similarly, at higher altitudes, water cannot hold as much oxygen as waters at lower altitudes. Look for these pattern in the Temperature and Altitude Tables in the DO Procedure. This is why a distilled water standard is used in the procedure and is corrected for temperature and altitude.

The actual amount of DO in a water may be higher or lower than the equilibrium value. Bacteria in the water consume oxygen as they digest decaying plant or animal materials. This can lower the DO levels of the water. In contrast, algae in lakes produce oxygen during photosynthesis that can sometimes result in higher DO levels in summer.

Procedure

- Following the steps in the *Dissolved Oxygen Procedure*, each member of the group takes a turn measuring the DO of the same sample. Compare your readings. Are they within 0.2mg/L of each other? Why? Why not? If not, repeat this exercise with another water sample until you obtain readings within 0.2mg/L of each other.
- If your water faucets have aerators on them, test a water sample freshly drawn from the faucet, one that was drawn at the beginning of the day and allowed to sit undisturbed in a bucket, and the preserved sample drawn at the same time. Record the time at which you tested the water in the bucket. How long has it been since the water was drawn? Compare the readings. Are they different? Why? Why not? What might account for these differences?
- Record readings as per sample below.

Student	Sample Tested	Time	DO